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it to get many a good meal, striking their beaks against the ground, until a worm shows its head, and then siezing it and drawing it forth. It is also said that the grotesque dances which some wading birds indulge in are solely for the purpose of attracting earthworms to the surface of the ground.

My own attention was attracted to the habit by noticing that a number of worms were wriggling about my feet as I stood talking with a neighbor in his freshly plowed garden. I had been moving about and tapping the soft loam with one foot, and the worms had appeared to find out the cause of the disturbance.

The ability of these animals, in the direction of climbing, is remarkable, and probably explains their occurrence in apparently inaccessible places, such as eave-troughs, etc., although it is not impossible that they are sometimes carried to such places by birds, or even that their eggs are blown to them by the wind and afterwards hatched.

I have seen them climb out of a Mason fruit jar of the quart size, in which there was not over an inch of earth, ascending the reverse curve at the top with as much ease as they did the straight part. In this case they were assisted by a certain amount of moisture on the inside of the jar. The conclusions deducible from the foregoing are:

First, That the worms do not rain down, but come from unpaved ground, near the walks and pavements on which they are found.

Second, That in some cases, at least, they can live for a long time entirely under water.

Third, That they may be attracted to the surface by tapping or striking on the ground.

Fourth, That they climb up perpendicular surfaces easily, even those of glass, if they are moist.

CHARLES A. DAVIS.

Alma, Mich.

Cats Hunting Snakes.

IN a late number of *Science* Mr. D. S. Martin asks for information in regard to the snake hunting habit of cats. It is such a common thing for cats to hunt snakes in this region of country that it seems to be expected of every ranch cat that she, or he, will hunt them. I have often seen my cat bring in snakes from three to four feet long. These are generally what are known as gopher or chicken snakes.

In Lafcadio Hearn's wonderfully magnificent word picture of Martinique ("A Midsummer Trip to the West Indies") he describes the grand forests of tropical vegetation in words that seem to bring them before one and then adds: "The lord of all these is the terrible fer-de-lance, the trigonocephalus, the bothrops lanceolatus, the craspodecephalus, deadliest of all occidental thanatophidia." His description of this snake is fine, and the manner in which it reigns supreme over the mountains, ravines, and forests during the day and the parks, highways and places of public resort at night shows plainly that he is right when he says the king of the island is this terrible snake. But even the king has his conqueror, and though it may be a long quotation I think the readers of *Science* will thank me for giving the words of this great master of language.

"The creature who fears the monster least is the brave cat. Seeing a snake, she at once carries her kittens to a place of safety, then boldly advances to the encounter. She will walk to the very limit of the serpent's striking range, and begin to feint, teasing him, startling him, trying to draw his blow. How the emerald and topazine eyes glow then!—they are flames. A moment more, and the trian-

gular head, hissing from the coil, flashes swift as if moved by wings. But swifter still the strong stroke of the armed paw that smites the horror aside, flinging it, mangled and gasping, in the dust. Nevertheless, pussy does not yet dare to spring; the enemy, still active, has almost instantly reformed his coil; but she is again in front of him, watching—vertical pupil against vertical pupil. Again the lashing stroke; again the beautiful countering; the living death is hurled aside, the scaled skin is deeply torn, one eye socket has ceased to flame. Once more the stroke of the serpent; once more the light, quick, cutting blow. But now the trigonocephalus is blind, is stupefied; before he can attempt to coil, pussy has leaped upon him, nailing the horrible flat head fast to the ground with her two sinewy paws. Now let him lash, writhe, twine, strive to strangle her!—in vain! he will never lift his head: an instant more and he lies still; the fine white teeth of the cat have severed the vertebrae just behind the triangular skull."

He does not say the cats eat them. Probably they do. With us they hunt, kill and eat common snakes. A writer in the *Americus (Ga.) Republican* in March, 1880, tells of a fight between a cat and a rattlesnake, but, though the cat sought the encounter, both animals were killed.

F. A. HASSLER, M.D., PH.D.

Santa Ana, Calif.

Mesabi Iron Range.

IN my paper on the "Mesabi Iron Range," published in *Science*, Feb. 9, I should have given credit to Horace V. Winchell for the rock series, instead of to Prof. N. H. Winchell.

Ironwood, Mich.

E. P. JENNINGS.

Temperature in High and Low Areas.

IN *Science* for April 14, 1893, and again for Sept. 22, I took issue with Dr. Hann, of Vienna, on a single point in his latest discussion of this question. In the *Meteorologische Zeitschrift* for December Dr. Hann again attempts to answer my argument. The original investigation was of 27 maxima and 27 minima of pressure that crossed the Alps from Oct., 1886, to Dec., 1890. In this study, the temperature and pressure at Sonnblick (10,170 ft.) were compared with the same conditions at Ischl (1530 ft.) at the base. This would give an air column of 8640 ft. Dr. Hann found that during the passage of high areas the temperature at Ischl was *higher* than in low areas, and I took the ground that this was directly contrary to the usual, well ascertained law, and hence that this whole exhaustive investigation attempting to prove that in high areas at Sonnblick the temperature is higher than in low areas must be discarded as erroneous.

Dr. Hann now makes no attempt to explain how he obtained such a peculiar result, but claims, first, that my point is a trivial one—"Die von Herrn Hazen citirten Ziffern enthalten nur die triviale Wahrheit, dass es zuweilen bei hohem Barometerstand auch im Winter wärmer sein kann, als bei niedrigem Barometerstand." Second, he shows that in the latter part of his original investigation he proved that the usual law holds in the Alps.

I desire to note one or two points in closing my share in this discussion.

First, I protest against the use of the expression "Barometerstand" in such studies. I called attention to this in 1887 in my first article on this most important theory Dr. Hann had accepted from an investigation of M. Decherows, namely, that at some height in the air the temperature was higher in a high area than in a low area. "Barometerstand" means barometer position or

reading and may have no connection whatever with a high area. There seems to be the utmost confusion in Dr. Hann's writings in which he uses barometer maxima and minima or the above indiscriminately. It is very certain that the whole meteorologic world has understood definite high and low areas, ordinarily called anticyclones and cyclones, in all these expressions.

Second, the point I made is by no means a trivial one, as the following figures from Dr. Hann show. I will take the two colder months, Feb. and March, from his table.

Temperature Fahr. at base of Sonnblick during high and low areas:

	HIGH AREA.	LOW AREA.
Feb.	33.8°	23.4°
March	39.2°	22.8°

I submit that temperatures 10.4° and 16.4° ^{higher} in a high area (anticyclone) than in a low area (cyclone) are not trivial.

Third, Dr. Hann himself shows that the usual law holds in the Alps, for in the latter part of this same paper there is a table giving the temperature in high areas 16° F. and in low areas 35° F., or a difference of 18° F. in exactly the opposite direction from that previously demonstrated.

I am inclined to think that these serious contradictions throw a cloud over this investigation, and it is of the utmost consequence that this be explained, but if it is not, then the original contention, that temperature in the Alps is higher in high areas than in low areas, must be abandoned.

H. A. HAZEN.

Washington, D. C.

Meandering Rivers in Missouri.

PROF. WM. B. DAVIS's letter, in *Science* of November 19, contains much that is suggestive relating to the extent and phases of past denudations over the area of the Ozark uplift. In my letter of July 21, however, to which his is a reply, it was not so much my object to attempt to fix the age of the Osage River, or to define the changes of level that have taken place, as it was to raise the question whether a past base-levelling was necessary to explain the meander phenomena of this and the other rivers referred to. I there undertook to explain how the sinuosities of such streams might develop in a country which was not base-levelled. Mr. Davis, with characteristic candor, accepts this as an "important correction" to his explanation. Briefly, and expressed in general terms, the view advanced was: that, under certain conditions of declivity and stratigraphy, streams will acquire entrenched meandering courses irrespective of whether the country be a flat plain or not, and irrespective of whether the lines of flow at the beginning of these conditions were decidedly sinuous or only gently curving. In any case, the radius of *developed* meanders will, of course, be proportional to the volume of the river.

This conclusion seems to follow logically from the premises that all rivers exert a sapping as well as a corradging action; or, in other words, that they tend to erode laterally as well as vertically. To produce these special results it is necessary that the declivity be not so great that lateral wear become altogether insignificant as compared with vertical wear; or that stratigraphic conditions be not such as to entirely thwart these tendencies

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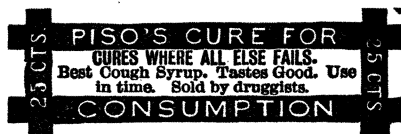


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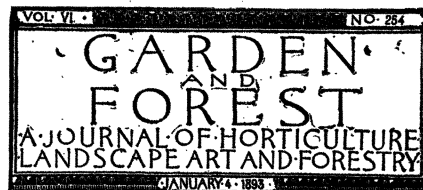
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